

CHAPTER 3

Property Description

Geographical Setting

North Table Mountain (NTM) is located in Butte County approximately five miles north of the city of Oroville (Figure 1). It juts out into the Sacramento Valley along the western edge of the foothills of the Sierra Nevada. Its prominence in the landscape is due to its unique geological history, which is described below. Access to NTMER is provided by Cherokee Road (Figure 2), which is accessed from the south through State Highway 149 or from the north through State Highway 70. Official access is through a small parking lot on the west side of Cherokee Road. There is no designated trail system but a network of permanent and seasonal trails have been established by visitor use patterns. The NTMER itself encompasses 3,315 acres.

Property Boundaries and Adjacent Lands

All surrounding lands are privately owned and are used as rangelands or for mining. Cherokee Road parallels the eastern side of the NTMER (Figure 2). The NTMER is located in the Oroville 7.5-minute United States Geological Survey (USGS) topographic quadrangle (quad) (Figure 3).

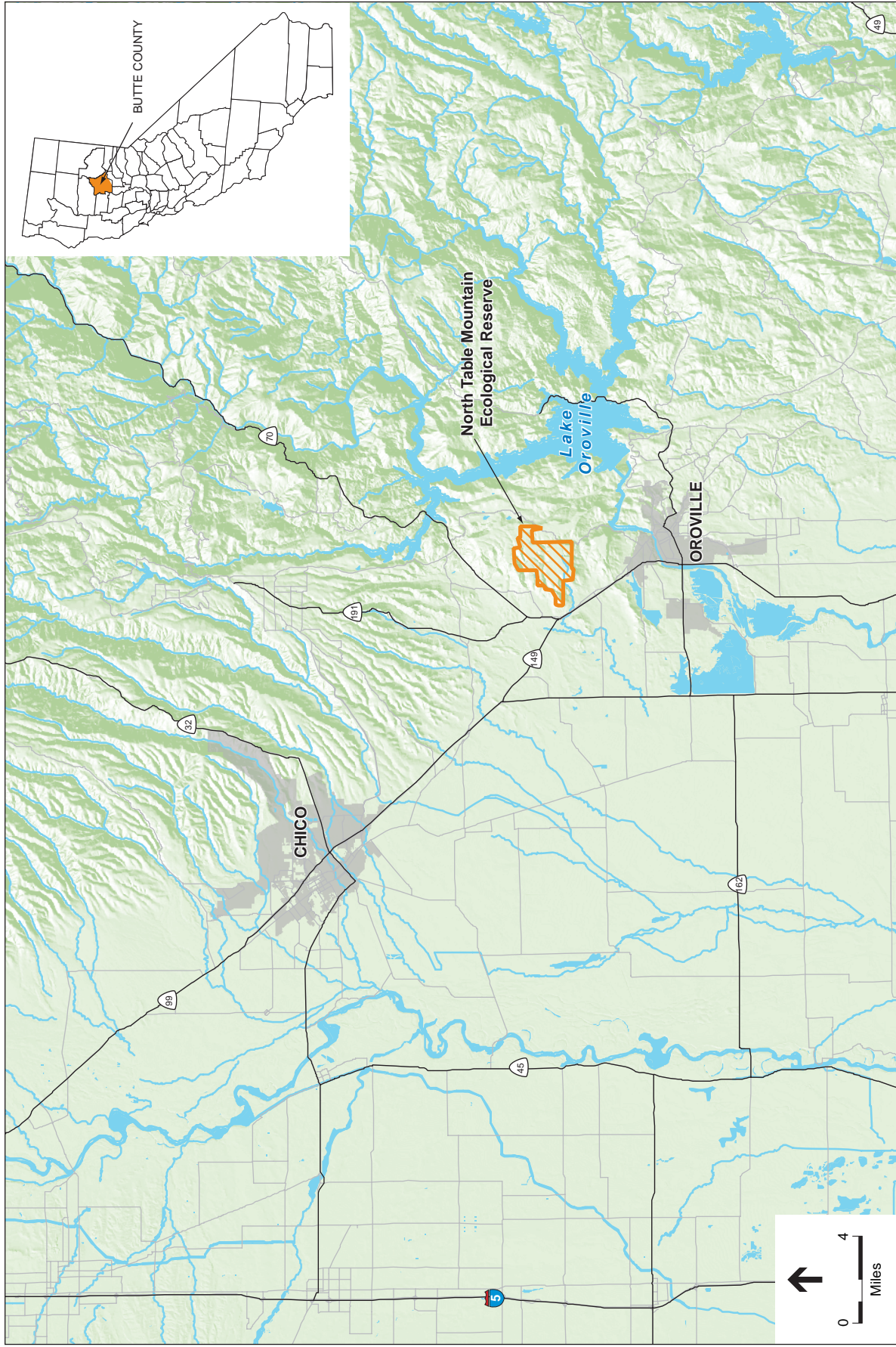
Geology, Soils, Climate, and Hydrology

North Table Mountain (NTM) is an isolated, relatively small, basalt-capped mesa that lies south of the vast basalt flows that blanket most of the northern end of the Sierra Nevada and southern Cascades (Wakabayashi and Sawyer 2001) (Photo 3-1). Approximately 57 to 35 million years ago, long before the Sierra Nevada existed, large, low-gradient river systems flowed westward to the ocean around the northern end of a raised topographic region. Gold-bearing gravels were deposited in the middle reaches of the rivers while finer sediment (Ione Formation) was deposited in their lower reaches (Wakabayashi and Sawyer 2001). The northern end of the Sierra Nevada roughly corresponds to the northern end of the ancient landscape, which sloped gently upward to the south. Between 35 million and 5 million years ago, a series of basalt lava floods flowed westward, sometimes for as far as 120 miles, from near the current location of Honey Lake Basin (Wakabayashi and Sawyer 2001). These flood basalts are probably related to the northeastward movement of the Yellowstone hotspot that generated the large areas of flood basalts throughout the northwestern United States (Wakabayashi and Sawyer 2001, Coe et al. 2005). North of the NTM, these basalt flows exist as large sheet flows covering the relatively flat ancient landscape

but, due to the southward increasing elevation of the ancient landscape, from NTM to their maximum southward extent (near the Stanislaus River), they exist only as stringers running through ancient river channels or water gaps (Wakabayashi and Sawyer 2001). Between 20 and 34 million years ago, other volcanic eruptions laid down a layer of rhyolitic tuff that buried much of the sheeted basalt flows. Approximately 16 million years ago, after a large river had cut a new river valley down through the tuff down to the underlying Ione Formation, a younger basalt flow, the Lovejoy Basalt, flowed westward through the river valley and formed a basalt cap over the exposed Ione Formation (Wakabayashi and Sawyer 2001). Later, approximately 5 million years ago, much of the central and northern Sierra Nevada was blanketed by volcanic andesite mudflows and the Sierra Nevada began a period of rapid uplift that tilted the Lovejoy Basalt and the other formations gently towards the west (Wakabayashi and Sawyer 2001). Down-cutting and erosion of the formations to the north, south, and west of NTM created an inverted topography in which the basalt-capped ancient river channel is currently the highest topographic point in the area.

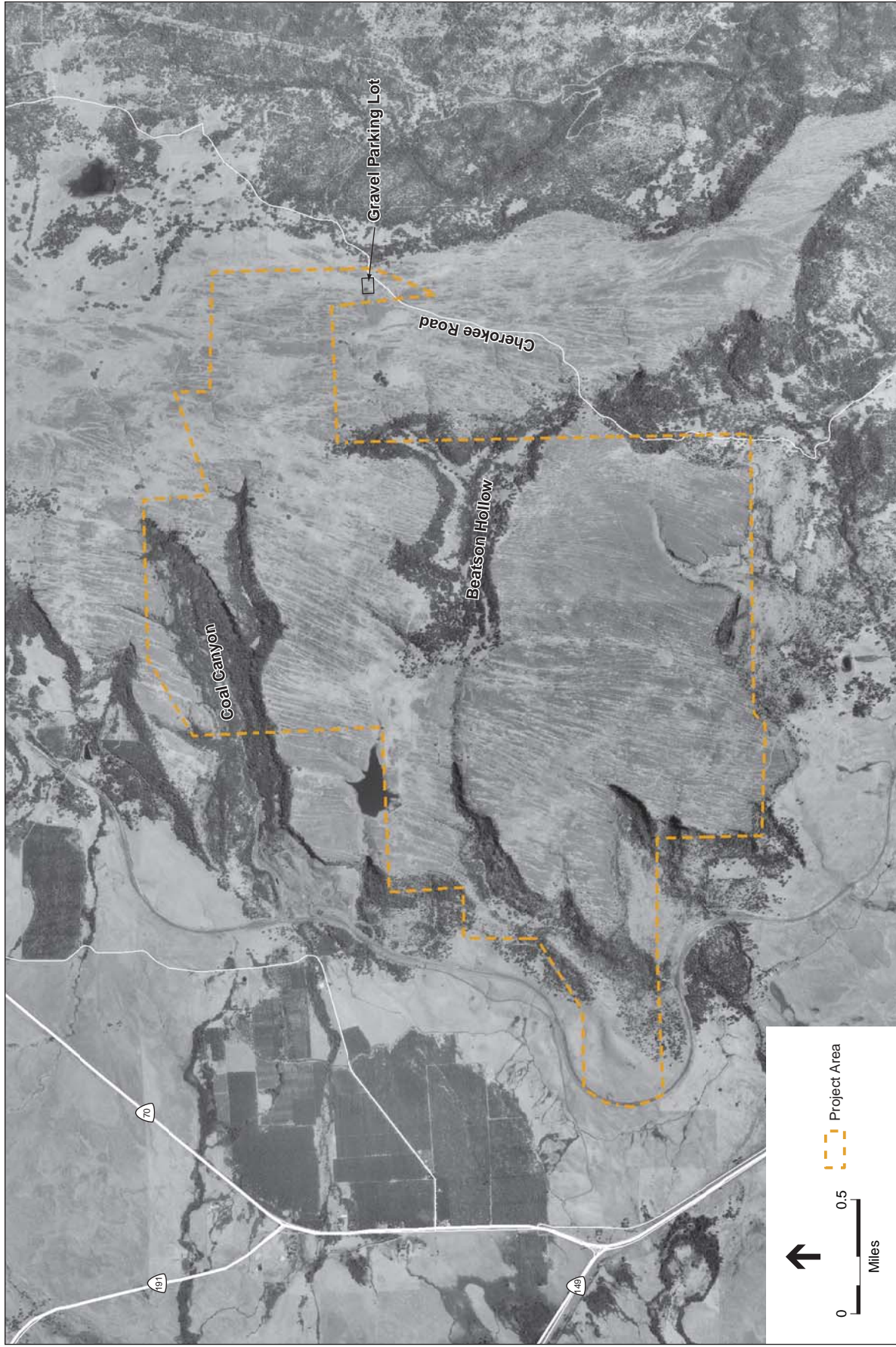


Photo 3-1: Coal Canyon Falls over Basalt Capped Mesa



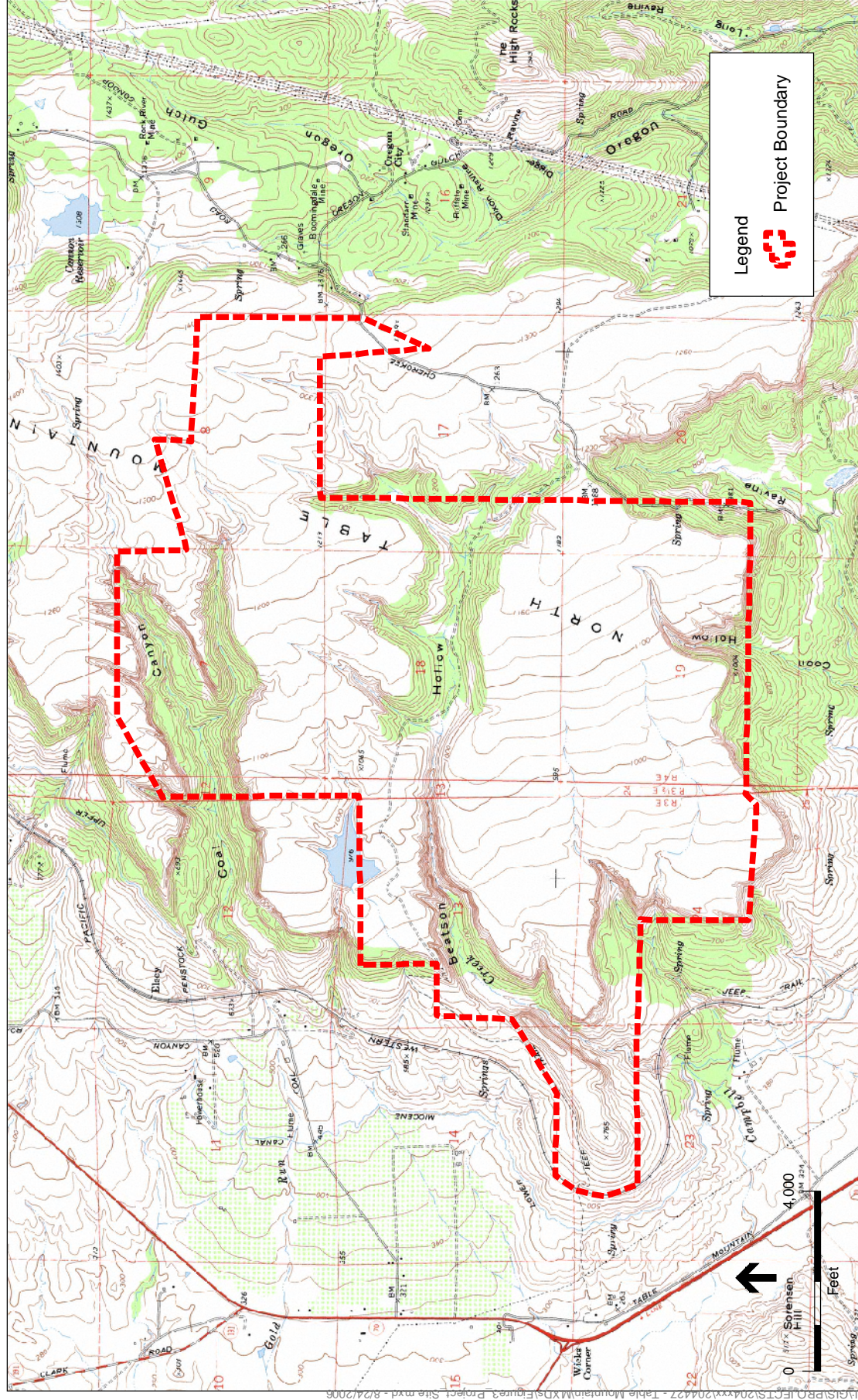
SOURCE: USGS, 1993; and ESA, 2006

North Table Mountain Ecological Reserve . 204427
Figure 1
Vicinity Map



SOURCE: USGS, 1993; and ESA, 2006

North Table Mountain Ecological Reserve . 204427
Figure 2
Project Site



SOURCE: USGS, 1969-1973, CDFG, 2004 and ESA, 2006

North Table Mountain, 204427

Figure 3 Oroville USGS Quad

North Table Mountain Ecological Preserve Project Boundary

The soils of NTM are closely related to their parent material, the concavity or convexity of the undulating surface of the basalt, and the presence or absence of joint fractures in the rock (Rust 2000, National Resource Conservation District 2006) (Appendix A). As expressed on the surface, the undulations are represented by an alternating series of narrow north-to-south-trending cobble trains and swales that are oriented perpendicular to the west-dipping topography of the top (Appendix A, Figure 2, Photo 3-3). A few relatively level areas on the top of NTM have developed the mound and intermound topography that is characteristic of vernal pools (Photo 3-2). Because all of these sources of variation occur in relatively small areas, the soils on top of NTM are mapped as complexes of multiple soil phases (Rust 2000, National Resource Conservation District 2006) (Appendix A).



Photo 3-2: Vernal Pool in Mound/Intermound Topography

Most of the top of NTMER (1,641 acres) (Photos 3-3, 3-4, 3-5, 3-6) is mapped as the Rock Outcrop-Thermalrocks-Campbellhills Complex, 2-15% slopes (Appendix A). The Rock Outcrop phase comprises about 35 percent of this mapping unit and exists as low convex trains of basalt cobbles that are often covered by Hansen's spike moss (*Selaginella hansenii*). The Thermalrocks phase covers about 15 percent of the mapping unit and borders the Rock Outcrop phase. It is generally less than 10 inches deep and does not typically pond due to its relatively higher topographic position. It is covered by Hansen's spike moss, yellow carpet (*Blenosperma nanum*), blue dicks (*Dichelostemma capitatum*), and annual fescue (*Vulpia microstachys*). Campbellshills is a 40- to 60-inch-deep soil that covers the 30 percent of the mapping unit that runs along the middle portions of the swales in fractures. It ponds frequently during the wet season and is dominated by soft chess (*Bromus hordeaceus*) and sky lupine (*Lupinus nanus*).

Cherorable-Kramn Complex, 2-15% slopes, is the next most extensive soil complex found on the top of NTMER (407 acres) (Appendix A). The Cherorable soil phase is deep (40 to 60 inches), occupies relatively flat areas with no to very low mound topography, and is unique because it contains rounded quartz gravels and sands from an unknown source. The Kramn soil phase is found under 2- to 3-foot-high mounds and is generally 20 to 40 inches deep. Both soils are covered by annual grasses and forbs.

Eisley-Beatson Hollow-Campbell Hills-Rock Outcrop Complex, 2-5% slopes, is the third most widespread soil mapping unit on top of NTMER (271 acres) (Appendix A). This complex is present on level areas on top of NTM and has characteristic vernal pool mound and intermound topography. The Eisley soil phase (35 percent of mapping unit) underlies the mounds and averages 38 inches deep, while the Beatsonhollow soil phase (30 percent of mapping unit) varies from 1 to 17 inches deep, underlies the swales and vernal pools, and is frequently ponded. Bird's eyes (*Gilia tricolor*) and Douglas' violet (*Viola douglasii*) are present on the low mounds while the vernal pool bottoms are carpeted by Fremont's goldfields (*Lasthenia fremontii*), white flowered navarretia (*Navarretia leucocephala* ssp. *leucocephala*), and Table Mountain meadowfoam (*Limnanthes douglasii* ssp. *nivea*).

The soils of the canyons consist of two primary complexes: Coalcanyon-Rock Outcrop-Cliffs-Talus-Coonhollow complex, 30-200% slopes, and Coalcanyon-Talus Complex, 15-30% slopes (832 combined acres) (Appendix A). Where soils are present in these complexes, they are deeper than 40 inches and are well-drained. Vegetation on the soils is dominated by blue oak (*Quercus douglasii*), interior live oak (*Quercus wislizeni*), foothill pine (*Pinus sabiniana*), California bay (*Umbellularia californica*), and western poison oak (*Toxicodendron diversilobum*) (Photos 3-7 & 3-8).

In the Mediterranean-type climate of the NTM, essentially all precipitation falls as rain (annual mean 29 inches; 60 inches maximum and 15 inches minimum) with most falling from November through March (Western Regional Climate Center 2005). Summers are hot and dry with a mean high temperature of 94 degrees F and an extreme high of 115 degrees F. Winters are cool and wet with a mean low temperature of 38 degrees F and an extreme low temperature of 12 degrees F.



Photo 3-3: Aerial View of Cobble Trains and Swales near Coon Hollow



Photo 3-4: Surface View Northward with Cobble Trains and Swales



Photo 3-5: Aerial View of Area of Cobble Trains Covered by Patches of Deeper Soil (light areas) with Quartz Gravels



Photo 3-6: Surface View Northeastward across Area of Deeper Soils over Cobble Trains

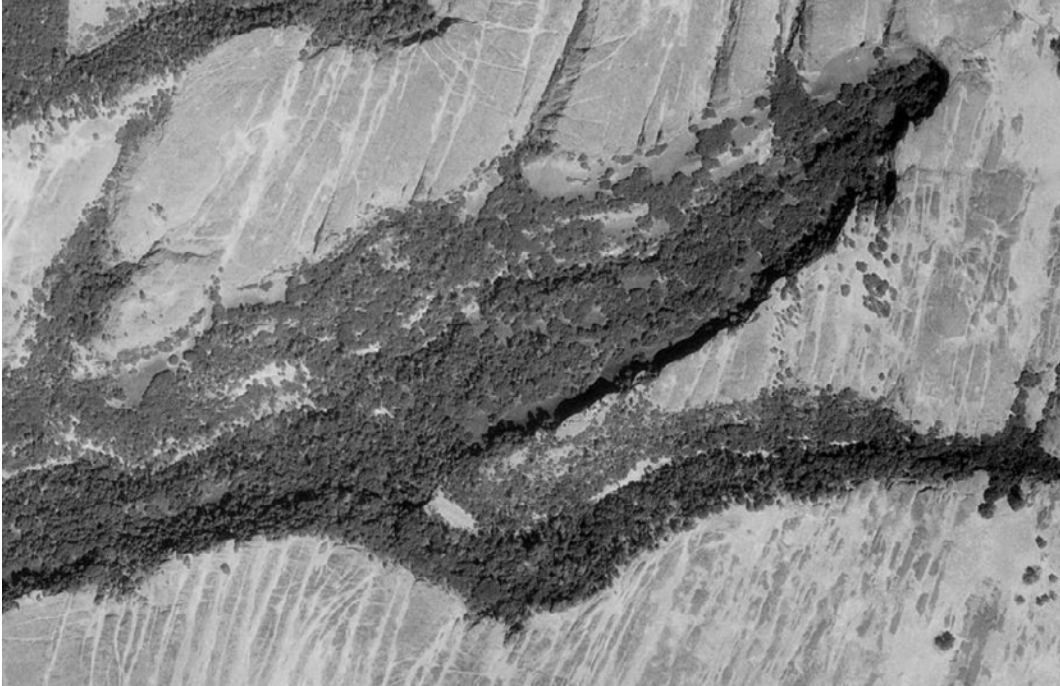


Photo 3-7: Aerial View of Upper End of Coal Canyon and its Vegetation



Photo 3-8: Vegetation in Canyon

The hydrology of NTM is dominated by the geologic substrate, by erosional features, and by soil features. The general slope of the basalt surface is to the west, and two deep canyons, Coal Canyon and Beatson Hollow, are being cut upslope by Coal Creek and Campbell Creek from the western edge of NTM towards the eastern edge (Figure 2). Undercutting of the basalt cap by these western drainages has resulted in high cliff faces that support three large waterfalls during the wet season (Photo 3-1). There are a few other minor drainages that are also cutting ravines upslope (Photo 3-3). On the top of NTM, ponding on the soil surface is determined by the depth to bedrock, microtopography, and the extent of cobbles. Areas with alternating cobble trains and swales pond briefly in the swales after rainstorms and the soils in the swales remain saturated for relatively long periods of time after the swales drain (Rust 2000). The tops of the cobble trains remain dry, but their lower margins may be briefly flooded after rainstorms. The vernal pools on the top of NTM are generally relatively shallow and pond and dry relatively rapidly (Photo 3-2).

Cultural Features

Archaeological

There is little archaeological data available for NTM and only a few small surveys have been made for sites or artifacts of native people (Kowta 1991). Four house pits were found at one location during one of those surveys.

Historical

Beginning in 1848 there was extensive mining activity immediately to the north, east, and south sides of NTM. During the 1860s and 1870s, two water conveyance systems were built across the west side of NTM to carry water to Morris Ravine for gold mining use (McDonald 1993). A flume system was erected at the base of NTM's bluff and a system of ditches, flumes, and iron pipes was built along the toe of NTM. Remnants of both systems exist but only a small section of the pipe has been mapped (Ledwith 2006). Existing vehicle trails appear not to be related to any historical structures.

Land Use

Livestock grazing has been the major historical land use of NTMER (Photo 3-9). Except for the recent elimination of biennial prescribed burning, cattle ranching operations on NTMER have used the same grazing management techniques for at least the past 45 years and those techniques have continued under the current lessee (T. York, personal communication). The entire top of NTM, NTMER and private lands combined, is stocked with approximately 360 mixed English-breed cow/calf pairs (calves 200 to 250 lbs) over a two- to three-week period after the fall green-up has begun. No records are available regarding the number of cow/calf pairs that are apportioned between NTMER and the adjacent private lands. This fact plus the annual variability in the amount of acreage available for lease on the private lands makes it difficult to precisely calculate

stocking rates for the NTMER. The animals are removed from the range between April 20 (dry springs) and May 10 (wet springs). Salt supplements that include selenium are provided at salt stations but the animals do not receive supplemental feed. Water is supplied during the wet season by seasonal streams and pools and by a stock pond on an adjoining private property. Dry season water is supplied by the stock pond and by four springs in the canyons. Typically, the animals are moved off the NTMER for pregnancy testing before the weather turns hot, but they can seek shade under the trees growing in the canyons as needed. The unique spatial arrangement of feed, water, and shade appears to maintain a particular grazing behavior that benefits most of the native plant species growing on the top of NTM.

Wildflower and waterfall viewing have been the main recreational activities on the NTMER (Photo 3-10). Most of this activity occurs in March and April, when 1,500 or more people daily may explore NTMER on weekends (Giordano 1993, H. Lomeli personal communication 2006) (Photo 3-11). Deer and upland game hunting is allowed at NTMER, but the hunting season is closed from November 15 through April 30.



Photo 3-9: Wildflowers with Cows Grazing at Western Edge of North Table Mountain



Photo 3-10: View towards Gravel Parking Lot



Photo 3-11: Hikers in Upper End of Beatson Hollow